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BILL NO.

2-95-03-12

GENERAL ORDINANCE NO. G-

10-95

AN ORDINANCE ESTABLISHING  
A RESPIRATOR POLICY FOR  
EMPLOYEES OF THE CITY OF FT. WAYNE

WHEREAS, the Occupational Safety and Health  
Administration (OSHA) has established specific accepted  
practices for employees who must utilize a respirator;

WHEREAS, these practices cover the use of respirators  
to protect employees of the City of Fort Wayne against the  
inhalation of harmful air contaminants and against oxygen-  
deficient atmospheres while performing work tasks in the  
workplace;

WHEREAS, a policy has been developed for city employees  
to address accepted practices;

NOW THEREFORE BE IT ORDAINED BY THE COMMON COUNCIL OF  
THE CITY OF FORT WAYNE, INDIANA:

SECTION 1. The Respirator Policy, a copy of which is  
attached hereto as Exhibit "A" is hereby adopted;

SECTION 2. That this Ordinance shall be in full force  
and effect from fifteen (15) days and after its passage and  
any and all necessary approval by the Mayor and shall apply  
to all agreements entered into after its effective date.

Clatus R Edmonds  
Council Member

APPROVED AS TO FORM  
AND LEGALITY

J. Timothy McCaulay  
J. Timothy McCaulay

Read the first time in full and on motion by Ravine, seconded by \_\_\_\_\_, and duly adopted, read the second time by title and referred to the Committee on Legislation (and the City Plan Commission for recommendation) and Public Hearing to be held after due legal notice, at the Common Council Conference Room 128, City County Building, Fort Wayne, Indiana, on \_\_\_\_\_, the \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_, at \_\_\_\_\_ o'clock \_\_\_\_\_ M., E.S.T.

DATED: 3-14-95

Sandra E. Kennedy  
SANDRA E. KENNEDY, CITY CLERK

Read the third time in full and on motion by Ravine, seconded by \_\_\_\_\_, and duly adopted, placed on its passage. PASSED ~~LOST~~ by the following vote:

	AYES	NAYS	ABSTAINED	ABSENT
TOTAL VOTES	<u>8</u>			<u>1</u>
BRADBURY	<u>✓</u>			
EDMONDS				<u>✓</u>
GIAQUINTA	<u>✓</u>			
HENRY	<u>✓</u>			
LONG	<u>✓</u>			
LUNSEY	<u>✓</u>			
RAVINE	<u>✓</u>			
SCHMIDT	<u>✓</u>			
TALARICO	<u>✓</u>			

DATED: 3-28-95

Sandra E. Kennedy  
SANDRA E. KENNEDY, CITY CLERK

Passed and adopted by the Common Council of the City of Fort Wayne, Indiana, as (ANNEXATION) (APPROPRIATION) (GENERAL) (SPECIAL) (ZONING) ORDINANCE RESOLUTION NO. B-10-95 on the 28th day of March, 1995.

ATTEST:

(SEAL)

Sandra E. Kennedy  
SANDRA E. KENNEDY, CITY CLERK

Don J. Schmitter  
PRESIDING OFFICER

Presented by me to the Mayor of the City of Fort Wayne, Indiana, on the 29th day of March, 1995, at the hour of 11:45 o'clock A. M., E.S.T.

Sandra E. Kennedy  
SANDRA E. KENNEDY, CITY CLERK

Approved and signed by me this 31st day of March, 1995, at the hour of 11:00 o'clock P. M., E.S.T.

PAUL HELMKE  
PAUL HELMKE, MAYOR

BILL NO. G-95-03-12

REPORT OF THE COMMITTEE ON  
REGULATIONS  
CLETUS R. EDMONDS - REBECCA J. RAVINE - CO-CHAIR  
ALL COUNCIL MEMBERS

WE, YOUR COMMITTEE ON REGULATIONS TO WHOM WAS  
REFERRED AN (ORDINANCE) (~~RESOLUTION~~) ESTABLISHING A RESPIRATOR  
POLICY FOR EMPLOYEES OF THE CITY OF FORT WAYNE

HAVE HAD SAID (ORDINANCE) (~~RESOLUTION~~) UNDER CONSIDERATION  
AND BEG LEAVE TO REPORT BACK TO THE COMMON COUNCIL THAT SAID  
(ORDINANCE) (~~RESOLUTION~~)

DO PASS

DO NOT PASS

ABSTAIN

NO REC

*Rebecca Ravine*

*Cletus R. Edmonds*

*Y. Bruburg*

*Mark C. Edwards*

*Cletus R. Edmonds*

DATED:

*3-28-95.*

Sandra E. Kennedy  
City Clerk



# The City of Fort Wayne

Paul Helmke, Mayor

24-Hour Job Line (219) 427-1186  
Benefits Administration (219) 427-1198  
EEO/Affirmative Action (219) 427-1180  
Labor Relations (219) 427-1180  
Payroll (219) 427-1292  
Personnel (219) 427-1180  
TDD (219) 427-1443  
FAX (219) 427-1393

Department of Human Resources  
Room 380

## **MEMORANDUM**

To: Members of the City of Ft. Wayne Common Council

From: Nelson Peters, Director of Human Resources

Subject: Respirator Policy

Date: February 28, 1995

\*\*\*\*\*  
The federal government recently imposed additional rules and regulations on employers. Consequently, it was necessary to develop policies to conform to those guidelines.

The enclosed policy deals with respirators and their use. The policy covers the use of respirators to protect employees of the city against the inhalation of harmful air contaminants and oxygen-deficient atmospheres while performing work tasks.

I have enclosed this policy for your review. This will be introduced to you on March 14, 1995. I understand that discussion will occur on March 21 with final action to be taken on March 28.

Should you have any questions regarding these policies, Debby Anderson from Risk Management or I will be happy to discuss them.

cc: Greg Purcell

Enclosures

**DIGEST SHEET**

**TITLE OF ORDINANCE:** An Ordinance Establishing A Respirator Policy For Employees Of The City Of Fort Wayne.

**DEPARTMENT REQUESTING ORDINANCE:**

Human Resources Department 03-09-95.

**SYNOPSIS OF ORDINANCE:** Protect employees of the City of Fort Wayne against the inhalation of air contaminants and oxygen-deficient atmospheres.

**EFFECT OF PASSAGE:** Will create Respirator policy to conform with legal requirements of OSHA.

**EFFECT OF NON-PASSAGE:** Will not be in compliance with OSHA.

**MONEY INVOLVED (DIRECT COSTS, EXPENDITURES, SAVINGS):**

**ASSIGNED TO COMMITTEE (PRESIDENT):**

CITY OF FORT WAYNE

POLICY & PROCEDURES

Respiratory Policy

- 1.0 Scope
- 1.1 Purpose
- 1.2 Definitions
- 2.0 Responsibility
- 2.1 Employer responsibility
- 2.2 Employee responsibility
- 2.3 Minimal acceptable respiratory program Department program administration
- 2.4 Disciplinary Procedures
- 3.0 Respirator Selection
- 3.1 Physiological and psychological limitations for respirator wearers
- 3.2 Respirator fit
- 3.3 Facial Hair
- 3.4 Communications
- 3.5 Vision
- 3.6 Respirator sealing problems
- 3.7 Respirator fitting tests
- 3.8 Fit test requirements
- 3.9 Acceptance criteria
- 3.10 Positive-pressure respirators
- 3.11 Facepiece
- 3.12 Repeated testing
- 3.13 Protective equipment
- 3.14 Fitting problems and alternatives
- 3.15 Number of respirators
- 3.16 Employee acceptance
- 3.17 Respirator fit test records
- 4.0 Training
- 4.1 Training for Employees
- 4.2 Training for Supervisor
- 4.3 Person issuing respirator
- 4.4 Respirator wearer
- 4.5 Emergency and rescue teams
- 4.6 Training frequency
- 5.0 Maintenance, inspection, and storage
- 5.1 Cleaning and sanitizing
- 5.2 Inspection
- 5.3 Parts replacement and repair
- 5.4 Storage
- 5.5 Air Quality
- 5.6 Breathing air from cylinders or air compressor

- 6.0 Qualifications
- 6.1 Written standard operating procedures
- 7.0 Worker activity
- 7.1 Respirator use conditions
- 7.2 Location of the potential hazardous area
- 7.3 Operational limitations
- 8.0 Approved respirators
- 8.1 Selection
- 8.2 Escape only respirators
- 8.3 Hazard determination steps
- 8.4 Selection steps
- 8.5 IDLH Selection of respirators
- 8.6 Special Considerations for confined spaces

Approved by Mayor Paul Helmke \_\_\_\_\_

DATE: \_\_\_\_\_

Revised 2/6/95

## Respiratory Policy

1.0 SCOPE: This policy sets forth accepted practices for respirator users: provides information and guidance on the proper selection, use and care of respirators.

This policy covers the use of respirators to protect employees of the City of Fort Wayne against the inhalation of harmful air contaminants and against oxygen-deficient atmospheres while performing work tasks in the workplace.

1.1 PURPOSE: The purpose of this policy is to provide information and guidance on the proper selection and use of respirators that will safeguard the life and health of users.

### 1.2 DEFINITIONS:

aerosol: particles, solid or liquid, suspended in air.

airline respirator: An atmosphere-supplying respirator in which the respirable gas is not designed to be carried by the wearer (formerly called supplied air respirators).

air-purifying respirator: A respirator in which ambient air is passed through an air-purifying element that removes the contaminant(s). Air is passed through the air-purifying element by means of the breathing action or by a blower.

approved: See certified.

assigned protection factor (APF): The expected workplace level of respiratory protection that would be provided by a properly functioning respirator or a class of respirators to properly fitted and trained users.

atmosphere-supplying respirator: A class of respirators that supply a respirable atmosphere, independent of the workplace atmosphere.

canister/cartridge: A container with a filter, sorbent, or catalyst, or combination of these items, which removes specific contaminants from the air passed through the container.

ceiling concentration: The concentration of an airborne substance that shall not be exceeded during any part of the working exposure.

certified: Evaluated and listed as permissible by the National Institute for Occupational Safety and Health (NIOSH), the Mine Safety and Health Administration (MSHA) or the Bureau of Mines (BM).



**continuous flow respirator:** An atmosphere-supplying respirator that provides a continuous flow of respirable gas to the respiratory inlet covering.

**demand respirator:** An atmosphere-supplying respirator that admits respirable gas to the facepiece only when a negative pressure is created inside the facepiece by inhalation.

**department head:** An individual who manages and is responsible for a department and reports directly to a division head.

**department program administrator:** An individual department head or designee having responsibility and authority for administration of the departmental respirator program.

**disposable respirator:** A respirator for which maintenance is not intended and that is designed to be discarded after excessive resistance, sorbent exhaustion, physical damage, or end-of-service-life renders it unsuitable for use. Examples of this type of respirator are a disposable half-mask respirator or a disposable escape-only self-contained breathing apparatus (SCBA).

**dust:** An aerosol consisting of mechanically produced solid particles derived from the breaking up of larger particles. Dusts generally have a larger particle size when compared to fumes.

**employee:** A Civil City or City Utilities employee of the City of Fort Wayne.

**employer:** City of Fort Wayne, Indiana

**end-of-service-life indicator:** A system that warns the user of the approach of the end of adequate respiratory protection.

**escape-only respirator:** A respirator intended only for use during emergency exit from a hazardous atmosphere.

**exposure limit:** The maximum allowable concentration of a contaminant in the air to which an individual may be exposed. These may be time-weighted averages, short-term limits, or ceiling limits.

**filter:** A component used in respirators to remove solid or liquid aerosols from the inspired air.

**fit check:** A test conducted by the wearer to determine if the respirator is properly seated to the face.

**fit factor:** A quantitative measure of the fit of a particular respirator to a particular individual.

**fit test:** The use of a challenge agent to evaluate the fit of a respirator on an individual.

**fume:** Solid aerosols formed by condensation of a gas or vapor. Fumes generally have a smaller particle size when compared to dusts.

**gas:** A fluid that has neither independent shape nor volume and tends to expand indefinitely.

**hazardous atmosphere:** An atmosphere that contains a contaminant(s) in excess of the exposure limit or that is oxygen deficient.

**hazard ratio:** A number obtained by dividing the concentration of a contaminant by its exposure limit.

**helmet:** A hood that offers head protection against impact and penetration.

**high-efficiency filter:** A filter that removes from the air 99.97% or more of the aerosols having a diameter of 0.3  $\mu\text{m}$  (micrometers).

**hood:** A respiratory inlet covering that completely covers the head and neck and may cover portions of the shoulders.

**Immediately Dangerous to Life or Health (IDLH):** Any atmosphere that poses an immediate hazard to life or poses immediate irreversible debilitating effects on health.

**loose-fitting facepiece:** A respiratory inlet covering that is designed to form a partial seal with the face, does not cover the neck and shoulders, and may or may not offer head protection against impact and penetration.

**mist:** An aerosol composed of liquid particles.

**negative-pressure respirator:** A respirator in which the air pressure inside the respiratory inlet covering is negative during inhalation with respect to the ambient air pressure.

**poor warning properties:** A substance whose odor, taste, or irritation effects are not detectable or not persistent at concentrations at or below the exposure limit.

**positive-pressure respirator:** A respirator in which the pressure inside the respiratory inlet covering is normally positive with respect to ambient air pressure.

**powered air-purifying respirator:** An air-purifying respirator that uses a blower to force the ambient atmosphere through air-purifying elements to the inlet covering.

**pressure-demand respirator:** A positive pressure atmosphere-supplying respirator that admits respirable gas to the facepiece when the positive pressure is reduced inside the facepiece by inhalation.

**qualitative fit test:** A pass/fail fit test that relies on the subject's sensory response to detect the challenge agent.

**quantitative fit test:** A fit test that uses an instrument to measure the challenge agent inside and outside the respirator.

**respirator:** A personal device designed to protect the wearer from the inhalation of hazardous atmospheres.

**respiratory inlet covering:** That portion of a respirator that connects the wearer's respiratory tract to an air-purifying device or respirable gas source, or both. It may be a facepiece, helmet, hood, suit, or mouthpiece/nose clamp.

**sanitization:** The removal of contaminants and the inhibiting of the action of the agents that cause infection or disease.

**self-contained breathing apparatus (SCBA):** An atmosphere-supplying respirator in which the respirable gas source is designed to be carried by the wearer.

**service life:** The period of time that a respirator provides adequate protection to the wearer.

**sorbent:** A material that is contained in a cartridge or canister and removes specific gases and vapors from the inhaled air.

**suit:** A respiratory inlet covering designed to cover the entire body. This term does not include protective clothing that only provides skin protection.

**supervisor:** A person who has the responsibility of overseeing the work activities of one or more persons who must wear respirators.

**tight-fitting facepiece:** A respiratory inlet covering that is designed to form a complete seal with the face. A half-facepiece (includes quarter masks, disposable masks, and masks with elastomeric facepieces) covers the nose and mouth; a full facepiece covers the nose, mouth and eyes.

**time-weighted average (TWA):** The average concentration of a contaminant in air during a specific time period.

**vapor:** The gaseous phase of matter that normally exists in a liquid or solid state at room temperature.

## 2.0 RESPONSIBILITIES

The department head and his or her designee's responsibilities shall include:

- monitoring of the respiratory hazards, maintaining records, and conducting program evaluations (outlined the respective department program).
- measuring, estimating, or reviewing information on the concentration of an air-borne contaminant in the work area prior to respirator selection and periodically during respirator use to ensure that the proper type of respirator is being used;
- selecting the appropriate type or class of respirator that will provide adequate protection for each contaminant, present or anticipated;
- maintaining records and written procedures in a manner that documents the department respirator program and allows for the evaluation of that program's effectiveness;
- evaluating the respiratory protection program's effectiveness.

The program shall be periodically audited by the Risk Management Department to ensure that (a) the program procedures reflect the requirements of current applicable regulations and industry accepted standards and (b) the program as implemented reflects the written procedures.

An audit checklist should be prepared and updated annually and as necessary. The audit program should focus, as a minimum, on the following areas:

- department program administration;
- training;
- medical evaluation (on file in Risk Mgmt. Dept.);
- fit testing (on file in Risk Mgmt. Dept.);
- air sampling/classification of hazard;
- selection and issuance;
- use;
- equipment cleaning, maintenance, and inspection;
- breathing air supplies;

- storage;
- emergency preparedness;
- special problems

An occupational health professional shall determine the requirements of the medical surveillance program.

Action shall be taken to correct any defects or shortcomings found during the audit. Findings shall be documented, including plans to correct problem areas and target dates for completion.

## 2.1 EMPLOYER RESPONSIBILITY

Respirators shall be provided by the employer when such equipment is necessary to protect the employee.

The employer shall provide the respirators that are applicable and suitable for the purpose intended.

The employer shall be responsible for the establishment and maintenance of a respiratory protection program that shall include the requirements outlined in the Minimal Acceptable Respirator Program.

A respirator wearer shall be permitted by the employer to leave the hazardous area for any respirator-related cause. Reasons may include, but are not limited to, the following:

- failure of the respirator to provide adequate protection;
- malfunction of the respirator;
- detection of leakage of air contaminant into the respirator;
- increase in resistance of respirator during breathing;
- severe discomfort in wearing the respirator;
- illness of the respirator wearer, including: sensation of dizziness, nausea, weakness, breathing difficulty, coughing, sneezing, vomiting, fever, and chills;
- to wash his/her face and the respirator facepiece to minimize skin irritation;
- to change the air-purifying elements or other components, whenever needed;
- to take periodic breaks in an uncontaminated area.

Malfunctions of respiratory protective equipment shall be investigated by the employer to determine the cause and to assure corrective measures are taken. Suspected manufacturing defects should be reported to the Risk Management Department immediately and to the manufacturer and the certifying agency.

## 2.2 EMPLOYEE RESPONSIBILITY

The employee shall use the provided respiratory protection in accordance with policies, instructions and training received.

The employee shall guard against damage to the respirator.

If a respirator malfunction occurs, the employee shall immediately leave the contaminated area and report the malfunction to a responsible supervisory person designated by the employer in the written standard operating procedures.

The employee shall report to the department head and the Risk Management Department any change in his/her medical status that may impact the employee's ability to wear a respirator safely.

## 2.3 MINIMAL ACCEPTABLE RESPIRATOR PROGRAM DEPARTMENT PROGRAM ADMINISTRATION

The responsibility and authority for the respirator program shall be assumed by the department head or assigned to a trained, identified employee designated within that same department. The administrator shall have knowledge of respiratory protection sufficient to supervise the respirator program properly.

## 2.4 DISCIPLINARY PROCEDURES

Failure to follow the City of Fort Wayne Respirator Policy shall result in disciplinary action per the City Policy and Procedure 6.14

## 3.0 RESPIRATOR SELECTION

The selection of the proper type(s) of respirator(s) shall be based upon:

- the nature of the hazardous operation or process;
- the type of respiratory hazard (including physical properties, oxygen deficiency, physiological effects on the body, concentration of toxic material or airborne radioactivity level, established exposure limits for the toxic material, established permissible airborne concentration for radioactive material, and established immediately dangerous to life or health concentration for toxic material);

- the location of the hazardous area in relation to the nearest area having respirable air;
- the period of time for which respiratory protection must be worn;
- the activities of workers in the hazardous area.

### 3.1 PHYSIOLOGICAL AND PSYCHOLOGICAL LIMITATIONS FOR RESPIRATOR WEARERS

A physician shall determine whether or not an employee has any medical conditions that would preclude the use of respirators. The physician shall follow the guidance in ANSI Z88.6-1984 or the most current Z88.6 standard on the frequency and content of the examination.

The program administrator shall advise the City's Risk Manager, who will then advise the physician of the following conditions to aid in the determination of the medical evaluation required:

- types of respirators for normal and emergency use;
- typical work activities, environmental conditions, frequency and duration of use;
- hazards for which the respiratory equipment will be worn including the potential exposures to reduced oxygen environments.

### 3.2 RESPIRATOR FIT

Each person shall be fit tested before being assigned a tight-fitting respirator (as outlined in **respiratory fitting tests**, 3.3-3.17). Each person using a tight-fitting respirator shall conduct a fit check of the respirator by appropriate means each time the respirator is donned or adjusted.

### 3.3 FACIAL HAIR

A respirator, either positive or negative pressure, equipped with a facepiece (tight or loose fitting) shall not be worn if facial hair comes between the sealing surface of the facepiece and the face or if facial hair interferes with valve function.

### 3.4 COMMUNICATIONS

Ambient noise environment and communication needs shall be considered when specific respirators are selected.

### 3.5 VISION

When a respirator user must wear corrective lenses, a protective spectacle or goggle, a face shield, a welding helmet, or other eye- and face-protective devices, the item shall be fitted to provide good vision and shall be worn in such a manner as not to interfere with the seal of the respirator.

Spectacles with straps or temple bars that pass through the sealing surface of either negative- or positive-pressure, tight-fitting, full-facepiece respirators shall not be used.

Contact lenses may be worn with respirators at each department's discretion per job requirements, provided the individual has previously demonstrated that he or she has had successful experience wearing contact lenses. The contact lens wearer shall practice wearing the respirator while wearing the contact lenses.

### 3.6 RESPIRATOR SEALING PROBLEMS

A head covering that passes between the sealing surface of a tight-fitting respirator facepiece and the wearer's face shall not be used.

The head harness straps of tight-fitting respirators shall not be positioned or worn over hard hats.

The wearing of a hard hat or other protective equipment shall not interfere with the seal of a respirator.

### 3.7 RESPIRATOR FITTING TESTS

A qualitative or quantitative respirator fit test, which the Risk Manager shall specify, shall be used to determine the ability of each individual respirator wearer to obtain a satisfactory fit with a tight-fitting respirator. The results of fitting tests among other criteria shall be used to select specific types, makes, and models of respirators for use by individual respirator wearers.

Requirements for acceptable tests are given in ANSI Z88.10 (Until ANSI Z88.10 is published, the protocol given in the OSHA Asbestos Standard, 29 CFR 1910.1001 should be followed).

### 3.8 FIT TEST

A respirator fit test shall be carried out for each wearer of a tight-fitting respirator at least once every 12 months or earlier. (Refer to 3.12)

1. The test subject shall be allowed to smell a weak concentration of the irritant smoke to familiarize the subject with the characteristic odor.



2. The test subject shall properly don the respirator selected and wear it for at least 10 minutes before starting the fit test.
3. The test conductor shall review this protocol with the test subject before testing.
4. The test subject shall perform the conventional positive pressure and negative pressure fit checks (see ANSI Z88.2 1980). Failure of either check shall be cause to select an alternate respirator.
5. Break both ends of a ventilation smoke tube containing stannic oxychloride, such as the MSA part #5645, or equivalent. Attach a short length of tubing to one end of the smoke tube. Attach the other end of the smoke tube to a low pressure air pump set to deliver 200 milliliters per minute.
6. Advise the test subject that the smoke can be irritating to the eyes and instruct the subject to keep the eyes closed while the test is performed.
7. The test conductor shall direct the stream of irritant smoke from the tube towards the faceseal area of the test subject. The person conducting the test shall begin with the tube at least 12 inches from the facepiece and gradually move to within one inch, moving around the whole perimeter of the mask.
8. The test subject shall be instructed to do the following exercises while the respirator is being challenged by the smoke. Each exercise shall be performed for one minute.
  - i. Breathe normally
  - ii. Breathe deeply. Be certain breaths are deep and regular.
  - iii. Turn head all the way from one side to the other. Be certain movement is complete. Inhale on each side. Do not bump the respirator against the shoulders.
  - iv. Nod head up-and-down. Be certain motions are complete and made every second. Inhale when head is in the full up position (looking toward ceiling). Do not bump the respirator against the chest.
  - v. Talking. Talk aloud and slowly for several minutes. The following paragraph is called the Rainbow Passage. Repeating it after the test conductor (keeping eyes closed) will result in a wide range of facial movements, and thus be useful to satisfy this requirement. Alternative passages which serve the same purpose may also be used.

## Rainbow Passage

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.

Respirators which do not have the capability of protecting against the irritant fume shall use the saccharin solution - aerosol protocol

### 3.9 ACCEPTANCE CRITERIA

If a quantitative fit test is used, a fit factor that is at least 10 times greater than the current assigned protection factor of the particular negative-pressure respirator shall be obtained before that respirator is assigned to an individual. If a qualitative test is used, only validated protocols are acceptable. The test shall be designed to access fit factors 10 times greater than the assigned protection factor.

### 3.10 POSITIVE-PRESSURE RESPIRATORS

Those respirators that have a tight seal to the face shall be qualitatively or quantitatively fit tested in a negative-pressure mode. The purpose of the test is to ensure that an unacceptable fit of the respirator to the wearer that degrades protection through leakage and would reduce service life for self-contained breathing apparatus does not occur. A fit factor of at least 100 shall be obtained.

### 3.11 FACEPIECE

If the facepiece of a positive-pressure, tight-fitting respirator is modified for fit testing:

- the modification shall not affect the normal fit of the device;
- the modification should not add significant weight, or cause significant imbalance;
- the air flow shall not be restricted;
- the modified facepiece should be leak tested on a mannequin head or similar device;
- such modified devices shall only be used for fit testing.

### 3.12 REPEATED TESTING

A fit test shall be repeated when a person has a condition that may interfere with facepiece sealing, such as a significant change in weight (10% or more), significant scarring in the area of the face seal, dental changes, reconstructive or cosmetic surgery, or any other condition that may affect the fit of the facepiece seal.

### 3.13 PROTECTIVE EQUIPMENT

Fit testing shall be done while wearing protective equipment, such as spectacles, goggles, face shield, or welding helmet, that will be worn during work activities and could interfere with the fit. The respirator should be configured in the way that it will be used, i.e., with a chin canister or cartridge.

### 3.14 FITTING PROBLEMS AND ALTERNATIVES

If facial features such as scars, hollow temples, excessively protruding cheekbones, deep creases in facial skin, the absence of teeth or dentures, or unusual facial configurations prevent a seal of a respirator facepiece to a wearer's face, the person shall not be permitted to wear the respirator.

### 3.15 NUMBER OF RESPIRATORS

No one size or model of respirator will fit all types of faces. Different sizes and models will accommodate more facial types. Therefore, an appropriate number of sizes and models shall be available from which a satisfactory respirator can be selected.

The number of models and sizes necessary to fulfill the intent of this requirement will vary for workplaces. For example, in a workplace with four workers, one model and size may fulfill the requirement; whereas a workplace with a hundred wearers may require different models in various sizes.

### 3.16 EMPLOYEE ACCEPTANCE

Respirator comfort is an important factor in wearer acceptance of the device. Other factors that influence wearer acceptance include breathing resistance, impairment of vision, impairment of communications, and respirator weight. Devices with greater wearer acceptance are likely to be worn more continually and thus provide more protection. Employee acceptance of a particular respirator model within a class shall be considered in selecting a respirator since this may determine whether or not the respirator is worn properly. If the results of the respirator fit test show that the person can obtain an acceptable fit with two or more models of the selected class of respirator, then the person should be permitted to use the preferred respirator model.

### 3.17 RESPIRATOR FIT TEST RECORDS

Respirator fit test records shall include the following information:

- written standard operating procedures for the respirator fit testing program including pass/fail criteria;
- type of respirator fit test(s) used, including the specific fit test protocol;
- type of respirator fit test instrumentation and equipment used;
- instrument and equipment calibration, maintenance, and repair, where applicable;
- name or identification of the test operator;
- specific make, model, and size of the exact respiratory protective device tested;
- name or identification of the person tested;
- results of respirator fitting tests, including:
- fit factor based upon quantitative fit test(s);
- success or failure to obtain a satisfactory fit based on qualitative fit test(s).
- any special considerations or difficulties in wearing (facial hair, contact lenses or glasses worn, dentures, forehead scars, etc.).

### 4.0 TRAINING

Each respirator wearer shall be given training (also annual and as needed retraining), which shall include explanations and discussions of the following:

- the respiratory hazard and the effect on the wearer if the respirator is not used properly;
- the engineering and administrative controls being used and the need for respirators to provide protection;
- the reason for selecting a particular type of respirator;
- the function, capabilities, and limitations of the selected respirator;

- the method of donning the respirator and checking its fit and operation;
- the proper wearing of the respirator;
- respirator maintenance, inspection, and storage;
- recognizing and handling emergency situations;
- applicable governmental regulations for specific substances.

#### 4.1 TRAINING FOR EMPLOYEES

The supervisor, person issuing respirators, respirator wearers, and emergency/rescue teams shall be given adequate training (and periodic retraining) by a qualified person(s) to ensure the proper use of respirators. Written records shall be kept of the names of persons trained and the dates when training occurred. Each department shall maintain these records and forward a copy to the Risk Management Department.

#### 4.2 TRAINING FOR SUPERVISORS

Supervisors shall be given adequate training including the following subjects as a minimum:

- basic respiratory protection practices;
- nature and extent of respiratory hazards to which persons under his/her supervision may be exposed;
- recognition and resolution of respirator use problems;
- principles and criteria for selecting respirators used by persons under his/her supervision;
- training of respirator wearers;
- fitting and issuance of respirators;
- inspection of respirators;
- use of respirators, including monitoring of use;
- maintenance and storage of respirators;
- regulations concerning respirator use.

#### 4.3 PERSON ISSUING RESPIRATORS

A person assigned the task of issuing respirators shall be given adequate training to ensure that the correct respirator is issued for each application in accordance with written standard operating procedures.

#### 4.4 RESPIRATOR WEARER

To ensure the proper and safe use of a respirator, the minimum training of each respirator wearer shall include the following elements:

- the need for respiratory protection;
- the nature, extent, and effects of respiratory hazards in the workplace;
- the need to inform their supervisor of any problems experienced by them or their co-workers.
- an explanation of why engineering controls are not being applied or are not adequate and what effort is being made to reduce or eliminate the need for respirators;
- an explanation of why a particular type of respirator has been selected for a specific respiratory hazard;
- an explanation of the operation, capabilities, and limitations of the respirator selected;
- instruction for inspecting and donning the respirator. This includes a requirement that a fit check shall be done each time the respirator is donned or adjusted;
- successful completion of a fit test in accordance with ANSI Z88.10. (Until ANSI Z88.10 is published, the protocol given in the OSHA Asbestos Standard, 29 CFR 1910.1001, should be followed.);
- an explanation of how to maintain and store the respirator;
- instructions in emergency procedures and the use of emergency escape devices;
- regulations concerning respirator use.

#### 4.5 EMERGENCY AND RESCUE TEAMS

Teams that are established by the department head for the purpose of responding to emergencies and/or rescues shall be properly trained in the use of respirators. A suitable training program shall be established that includes emergency drills to ensure the proficiency and familiarity of team members to use the respirators effectively while performing such emergency and/or rescue operations.

#### 4.6 TRAINING FREQUENCY

For each employee, records shall be maintained that give the date and type of training received, performance results (as appropriate), and the instructor's name.

#### 5.0 MAINTENANCE, INSPECTION, AND STORAGE

Maintenance shall be carried out according to the manufacturer's instructions and on a schedule that ensures that each respirator wearer is provided with a respirator that is clean, sanitary, and in good operating condition. Each respirator shall be inspected by the wearer prior to its use to ensure that it is in proper working condition. Respirators shall be stored in a convenient, clean, and sanitary location.

#### 5.1 CLEANING AND SANITIZING

Respirators shall be cleaned and sanitized in accordance with the requirements.

Respirators issued to an individual shall be cleaned and sanitized regularly. Each respirator shall be cleaned and sanitized before being worn by different individuals. Respirators intended for emergency use shall be cleaned and sanitized after being used.

#### 5.2 INSPECTION

The user shall inspect the respirator immediately prior to each use to ensure that it is in proper working condition. After cleaning and sanitizing, each respirator shall be inspected to determine if it is in proper working condition, if it needs replacement of parts or repairs, or if it should be discarded. Each respirator stored for emergency or rescue use shall be inspected at least monthly.

Respirator inspection shall include a check for tightness of connections; for the condition of the respiratory inlet covering, head harness, valves, connecting tubes, harness assemblies, hoses, filters, cartridges, canisters, end-of-service-life indicator, electrical components, and shelf-life date(s); and for the proper function of regulators, alarms, and other warning systems. Each rubber or other elastomeric part shall be inspected for pliability

and signs of deterioration. Each air and oxygen cylinder shall be inspected to ensure that it is fully charged according to the manufacturer's instructions.

A record of inspection dates shall be kept for each respirator maintained for emergency or rescue use. Respirators that do not meet applicable inspection criteria shall be immediately removed from service and repaired or replaced.

### 5.3 PARTS REPLACEMENT AND REPAIR

Replacement of parts or repairs shall be done only by persons trained in proper respirator maintenance and assembly. Replacement parts shall be only those designated for the specific respirator repaired. Reducing or admission valves, regulators, and alarms shall be adjusted or repaired by the respirator manufacturer or a technician trained by the manufacturer. Instrumentation for valve, regulator, and alarm adjustments and tests should be calibrated to a standard traceable to the National Institute of Standards and Technology (NIST), at a minimum of every 3 years.

### 5.4 STORAGE

Respirators shall be stored in a manner that will protect them against physical and chemical agents such as vibration, shocks, sunlight, heat, extreme cold, excessive moisture, or damaging chemicals. Respirators shall be stored to prevent distortion of rubber or other elastomeric parts. Respirators shall not be stored in such places as lockers and tool boxes, unless they are protected from contamination, distortion, and damage. Emergency and rescue use respirators that are placed in work areas shall be quickly accessible at all times, and the storage cabinet or container in which they are stored shall be clearly marked.

### 5.5 AIR QUALITY

Compressed gaseous air, compressed gaseous oxygen, liquid air, and liquid oxygen used for respiration shall be of high purity. Compressed gaseous or liquid oxygen shall meet the requirements of the United States Pharmacopoeia for medical or breathing oxygen. Compressed gaseous air shall meet at least the requirements of the specification for Type I - Grade D breathing air, and liquid air shall meet at least the requirements for Type II - Grade B breathing air as described in ANSI/CGA G-7.1-1969.

### 5.6 BREATHING AIR FROM CYLINDERS OR AIR COMPRESSORS

Breathing air may be supplied to supplied-air respirators from cylinders or air compressors.

Cylinders shall be tested and maintained in accordance with applicable Department of Transportation specifications for shipping



containers (Title 49, Code of Federal Regulations, Part 173, and Part 178).

A compressor shall be constructed so as to avoid entry of contaminated air. For all air compressors, including portable types, the air intake location shall be carefully selected, and monitored closely to ensure continued quality of air supply to the compressor. The system shall be equipped as necessary with a suitable in-line air-purifying sorbent bed and filter to further assure breathing air quality. Maintenance and replacement of refurbishment compressor and associated air-purifying or filter media shall be performed periodically, by trained personnel following manufacturer's recommendations and instructions.

Breathing air couplings shall be incompatible with outlets for nonrespirable plant air or other gas systems to prevent inadvertent servicing of supplied-air respirators with nonrespirable gases. Breathing air outlets shall be labeled.

Breathing gas containers shall be marked in accordance with ANSI/CGA C-4-1990. Further details on sources of compressed air and its safe use will be found in CGA G-7-1988.

## 6.0 QUALIFICATIONS

Department heads, in order to exercise their responsibility, shall be knowledgeable in respiratory protection requirements and regulations. Supervisors shall keep abreast of current issues/advances and regulations and ensure compliance by their employees.

## 6.1 WRITTEN STANDARD OPERATING PROCEDURES

Written standard operating procedures for the proper use of respirators in routine and emergency situations shall be established by the department head. Copies of the procedures shall be available for employees to read. The procedures shall be periodically reviewed and revised by the employer as necessary. The procedures shall include the following elements:

- a) Operating procedures for routine use: Written standard operating procedures shall cover a complete respirator program and shall include information necessary for the proper use of respirators, including, as a minimum:
  - 1) training of wearers;
  - 2) fit tests;
  - 3) issuance;
  - 4) cleaning, storage, and maintenance;

- 5) inspection;
- 6) monitoring use;
- 7) monitoring hazards;
- 8) selection;
- 9) company policies.

The written procedures for the emergency and rescue uses of respirators shall be developed in the following manner:

- 1) An analysis of the emergency and rescue uses of respirators that may occur in each operation shall be made by careful consideration of material, equipment, work area, processes, and personnel involved;
- 2) Based upon the analysis, a determination should be made whether the respirators available can provide adequate protection to allow workers to enter the potentially hazardous environments. There are situations where equipment limitations may preclude workers entering an IDLH environment (for example, potentially flammable or explosive environments);
- 3) Appropriate types of respirators shall be selected, and an adequate number shall be provided where they may be needed for emergency or rescue use.
- 4) These respirators shall be selected, and an adequate number shall be provided where they may be needed for emergency or rescue use.

The procedure shall be reviewed by a person who is thoroughly familiar with the particular process or operation. Consideration shall be given to past occurrences requiring emergency or rescue uses of respirators as well as conditions that resulted in such respirator applications. The possible consequences of equipment or power failures, uncontrolled chemical reactions, fire, explosion, or human error shall be given consideration. Potential hazards that may result in emergency or rescue use of respirators shall be identified.

#### 7.0 WORKER ACTIVITY

Worker activity and worker location in a hazardous area shall be considered in selecting the proper respirator (for example, whether the worker is in the hazardous area continuously or intermittently during the work shift and whether the work rate is light, medium, or heavy).

### 7.1 RESPIRATOR USE CONDITIONS

The period of time that a respirator must be worn is an important factor that shall be taken into account in selecting a respirator. Consideration shall be given to the type of respirator application, such as for routine, nonroutine, emergency, or rescue use.

### 7.2 LOCATION OF THE POTENTIAL HAZARDOUS AREA

The location of the hazardous area with respect to a safe area having respirable air shall be considered in selecting a respirator. This will permit planning for the escape of workers if an emergency occurs, for the entry of workers to perform maintenance duties, and for rescue operations.

The physical characteristics, the functional capabilities, and the performance limitations of various types shall be considered in selecting a respirator.

### 7.3 OPERATIONAL LIMITATIONS

Environmental conditions and level of effort required of the respirator wearer may affect respirator service life. For example, extreme physical exertion can cause the user to deplete the air supply in a SCBA such that service life is reduced by half or more.

### 8.0 APPROVED RESPIRATORS

Only NIOSH (National Institute of Safety and Health), MSHA (Mine Safety Health and Administration), BM (Bureau of Mines) approved respirators shall be used. Unauthorized respirators shall not be used. Any change or modification, however minor, may void the respirator approval and significantly affect the performance of the respirator, and therefore shall be prohibited.

### 8.1 SELECTION

Respirator selection involves reviewing each operation to:

- determine what hazards may be present (hazard determination) and
- select which type or class of respirators can offer adequate protection.

### 8.2 ESCAPE-ONLY RESPIRATORS

Where escape-only respirators are provided because of the potential for an emergency, personnel assigned to the area shall be trained in their use.

Personnel not assigned to the work area and visitors shall be briefed in the use of these respirators. Other requirements such as medical approval for use and detailed training are not required for these people.

### 8.3 HAZARD DETERMINATION STEPS

The nature of the hazard shall be determined as follows:

- a) Determine what contaminant(s) may be present in the workplace;
- b) Determine whether there is a published Threshold Limit Value, Permissible Exposure Limit, or any other available exposure limit or estimate of toxicity for the contaminant(s). Determine if the IDLH concentration for the contaminant is available;
- c) Determine if there is a comprehensive health standard (e.g., lead, asbestos) for the contaminant(s). If so, there may be specific respirators required that will influence the selection process;
- d) If the potential for an oxygen-deficient environment exists, measure the oxygen content;
- e) Measure or estimate the concentration of the contaminant(s).
- f) Determine the physical state of the contaminant. If an aerosol, determine or estimate the particle size. Determine if vapor pressure of the aerosol is significant at the maximum expected temperature of the work environment;
- g) Determine whether the contaminant(s) present can be absorbed through the skin, produce skin sensitization, or be irritating or corrosive to the eyes or skin;
- h) determine for a gas or vapor contaminant(s) if a known odor, taste, or irritation concentration exists.

### 8.4 RESPIRATOR SELECTION STEPS

The proper respirator shall be selected as follows:

- a) If unable to determine what potentially hazardous contaminant may be present, the atmosphere shall be considered IDLH; go to IDLH 8.5;
- b) If no exposure limit or guideline is available, and estimates of the toxicity cannot be made, the atmosphere shall be considered IDLH; go to IDLH 8.5;

- c) If a specific standard exists for the contaminant, follow those guidelines/requirements;
- d) If there is an oxygen-deficient atmosphere, go to IDLH 8.5;
- e) If the measured or estimated concentration of the contaminant(s) is considered IDLH; go to IDLH 8.5;
- f) If the contaminant(s) is a gas or vapor only, select a device with an assigned protection factor that is greater than the hazard ratio. The concentration shall also be less than the maximum use concentration of the cartridge/canister; go to (1). If an aerosol contaminant is present, go to (g, h, & i) below;
- g) If the contaminant is a paint, lacquer, or enamel, select a respirator approved specifically for paint mists or an atmosphere-supplying respirator. (Approval label or regulatory provision may preclude use for some paints.);
- h) If the contaminant is an aerosol, with an unknown particle size or less than 2  $\mu\text{m}$  (micrometers), a high-efficiency filter shall be used;
- i) If the contaminant is an aerosol, with a particle size greater than 2  $\mu\text{m}$  (micrometers), any filter type (dust, fumes, mist, or high-efficiency) may be used;
- j) If the contaminant is a fume, use a filter approved for fumes or a high-efficiency filter;
- k) If the contaminant is a pesticide, select a respirator and filtration system specifically approved for pesticides or an atmosphere-supplying respirator. (Approval label may preclude use for some pesticides.);
- 1) If the contaminant is a gas or vapor and has poor warning properties, the use of an atmosphere-supplying respirator is generally recommended. When atmosphere-supplying respirators cannot be used because of the lack of a feasible air supply or because of the need for worker mobility, air-purifying devices should be used only if:
  - 1) the air-purifying respirator has a reliable end-of-service-life indicator that will warn the user prior to contaminant break-through or;
  - 2) a cartridge change schedule is implemented based on cartridge service data including desorption studies (unless cartridges are changed daily), expected concentration, pattern of use, and duration of exposure have been established, and the chemical does not have a ceiling

limit.

A location is considered IDLH when:

- it is an atmosphere known or suspected to have concentrations above the IDLH level, or
- it is a confined space that contains less than the normal 19.5 or above 23.5% oxygen, unless the source of the oxygen reduction is understood and controlled.

#### 8.5 IDLH SELECTION OF RESPIRATORS FOR ATMOSPHERES IMMEDIATELY DANGEROUS TO LIFE OR HEALTH

The required respiratory protection for IDLH conditions caused by the presence of toxic material or a reduced percentage of oxygen as described is a positive-pressure SCBA or a combination of a supplied-air respirator with SCBA.

When respirators are worn under IDLH conditions, at least one standby person shall be present in a safe area. The standby person shall have the proper equipment available to assist the respirator wearer in case of difficulty. Communications (visual, voice, signal line, telephone, radio, or other suitable means) shall be maintained between the standby person and the wearer. While working in the IDLH atmosphere, the wearer shall be equipped with safety harness and safety lines to permit removal to a safe area, if necessary. Provisions for rescue other than safety harness and lines may be used, if equivalent to the standards set forth in the City's Confined Space Policy.

#### 8.6 SPECIAL CONSIDERATIONS FOR CONFINED SPACES

Confined spaces continue to be the cause of numerous deaths and serious injuries. Therefore, any confined space containing less than 19.5 or above 23.5% oxygen is to be considered IDLH, unless the source of the oxygen reduction is understood and controlled. This restriction is imposed because any reduction in the percentage of oxygen present is proof, at a minimum, that the confined space is not adequately ventilated. It will be necessary to fully understand the source of the reduction in oxygen and control the level such that assurance can be given that there are no poorly ventilated areas that the worker may encounter. Without complete understanding and control of the atmosphere within the confined space, it shall be considered IDLH.